# ATOMIC ENERGY *Newsletter*

THE FIRST AND ONLY ATOMIC [illegible] SERVICE

ROBERT M. SHERMAN, EDITOR. PUBLISHED BI-WEEKLY BY ATOMIC ENERGY NEWS, INC., 509 FIFTH AVENUE, NEW YORK 17, N. Y.


January 2nd, 1951.
Vol. 4...No. 10

Dear Sir:

Nineteen construction projects for atomic energy purposes make up the $1,050,000,000.00 in the USAEC's second supplementary request for funds, now before Congress. (Last week, in two divergent actions, the funds were decreased by the House, and increased by the Senate.) Major amounts will be for initial work on both the new $500 million U-235 separation plant near Paducah, Ky. (below), and the new tritium producer-Savannah River Plant, near Augusta, Ga., which is expected to cost upward of $600 million.....The Tennessee Valley Authority also asked Congressional approval for $84 million to build a new steam electric plant in the western sector of its system. The agency proposed to spend $59 million of its new funds to begin work on the plant which, when completed, would cost $184 million and would add 1 million KW capacity to its system, mainly for the use of the USAEC. (No cognizance was taken in the TVA fund request of the offer by a private firm to supply one-half the Paducah plant's power requirements. See: AEN-12/19/50, p.1: "Electric Energy, Inc., a private power organization for Paducah".)

Principal construction contractor on this new Paducah, Ky., U-235 facility will be F. H. McGraw and Co., Hartford, Conn. Under a $350,000,000.00 USAEC contract, the McGraw firm will build all structures at the site, including process buildings, supporting service facilities, etc., and will install production equipment. Contracts have also been signed between the USAEC and three architect-engineer firms for work here: Giffels & Vallet, Inc., Detroit, for preliminary engineering and design of the process plant; Sargent & Lundy, Chicago, for power studies and the design of power facilities; and Smith, Hinchman & Grylls, Inc., Detroit, for design and engineering of utilities. Union Carbide & Carbon's chemicals division (now operating the U-235 plants and other facilities at Oak Ridge) will operate the Paducah plant. Carbide will also handle process design and procurement of the special and critical materials needed. (The new plant, for which approximately 5,000 acres have been set aside, about 16 miles west of Paducah, Ky., will require a peak construction force of about 10,000 workers; upon completion, it may permanently employ as many as 1,600 persons. Top man there for the USAEC will be Kenneth A. Dunbar, former Oak Ridge director of production and engineering, who will head the USAEC's Kentucky Area Office, to be established for the project. However, this office is under Oak Ridge supervision. Paul Huber, now assistant plant superintendent at the K-25 plant at Oak Ridge, will direct the Paducah plant for Carbide.)

A three day in-service training course in Radiological Health will be given February 5-8 by the School of Public Health, University of Michigan, Ann Arbor. While designed especially for such health department people as health officers, engineers, industrial hygiene workers, and nurses, it is broad enough to serve other public health personnel, as well as workers in industry.

Subscription rates: United States, U.S. possessions, and Canada, $18.00 a year. Latin America, $20.00 a year. All other countries, $25.00 a year.

Special Digest of Selected Papers, in the Field of Atomic Energy, Presented at the Annual Meeting of the American Association for the Advancement of Science, December 26-30, in Clevelnd, Ohio.

ATOMIC POWER- In discussing the prospects for industrial atomic power, Dr. Lyle B. Borst, Chairman, Department of Reactor Science and Engineering, Brookhaven National Laboratory, L. I., pointed out that since world energy uses have doubled in the past twenty years, the supply of fossil fuels (coal, petroleum, etc.) may become short within the next hundred years. Of resources not presently exploited (i.e., tides, wind, solar energy, uranium) uranium constitutes a significant source of energy for industrial development. While published estimates of national resources justify its consideration as a supplement to fossil fuels, uranium as an energy source does not, at present, challenge fossil fuels economically. Capital costs are high, and can only be accepted where a reactor is not in competition with other devices, e. g., in military propulsion. Capital costs may best be compared with hydro installations intended for flood control as well as power generation. Operating costs, including fuel, are expected to be nearly competitive with a central power station using fossil fuels.

CHEMISTRY- The three phases of chemistry's contribution to atomic energy were covered by J. A. Swartout, Oak Ridge National Laboratory, who described them as (1) wartime program leading to production of military weapon, (2) current, more diversified research, initiated after the war, and (3) the anticipated future direction and objectives of research. Now, he said, chemistry is assuming a portion of the primary role in the development of nuclear reactors. This is especially true in the case of homogeneous type reactors in which the critical problems are chemical in nature. The possibility of practical application of atomic energy to power production appears to rest in large measure upon the successful solution of chemical problems in such fields as radiation chemistry, and high temperature chemistry. Unfortunately, it is in these fields, in particular, that the applied demands are outstripping fundamental knowledge. Swartout emphasized the necessity for expanding fundamental rearch in these critical, specialized fields of chemistry.

PHARMACY- An approach to the medical problems of an atomic bombing, where experience indicates that approximately 40% of the deaths will be due to burns, was discussed by R. A. Ravich, M. D., and E. Revici, M. D., of the Institute of Applied Biology, Brooklyn, N. Y. Indications are, they stated, that transfusions alone help to correct only one aspect of the problem. Furthermore, conditions immediately following an attack that caused serious injury to many thousands of persons would be such as to make the use of transfusions of blood or blood substitutes impossible. Since the shock that follows severe burns or other types of trauma is related to cellular damage, and injured cells have an altered metabolism that can be the essential cause of the general reaction known as shock, an attempt was made at the Institute to control shock by influencing the lipid metabolism of the damaged cells themselves. Animal experiments at the Institute have shown that a mixture composed of n-butyl alcohol and sodium lactate can prevent or counteract shock in severely burned mice. In the experiments, mice were burned so severely that only 10% of the control animals were still alive after 18 hours. However, 67% of the treated mice survived beyond this time. Ravich and Revici stated that n-Butanol has been used in over 2000 patients, with favorable effects on wound healing and relief of pain, and that it has many characteristics of an ideal emergency drug.

RADIOACTIVE WASTE DISPOSAL- While many of the methods available for use in the treatment of industrial wastes may be utilized in the treatment of radioactive wastes, just as in sewage and industrial waste treatment, separation of the wastes into their liquid and solid fractions, and discharge of the inocuous fraction, does not solve the problem, C. B. Straub, Sanitary Engineer, U. S. Public Health Service (now at Oak Ridge) told the Association. The residue remains for disposal. All that can be accomplished is to concentrate the radioactive fraction into a smaller volume to permit disposal either as a slurry or as a sludge.

NEW PRODUCTS, PROCESSES & INSTRUMENTS...for nuclear work...

From The Manufacturers- Cobalt-60, now available in the form of high specific activity, sealed sources (normally 200 and 400 mc), specifically designed for use in industrial radiography. The cost of these cobalt-60 sources is very much less than comparable radium sources. The source is hermetically sealed in a ferromagnetic stainless steel source container, with provision for handling by various means.--Tracerlab, Inc., Boston 10, Mass.

Research quality Geiger-Muller tubes for radiation detection applications. The types include: NRG-10, with a 5/8" diameter glass bubble window, and extremely low background; NRG-20, a 300 mg/sq. cm. glass wall gamma tube; NRG-40, a 30 mg/sq. cm. wall beta-gamma probe type tube for portable applications; and the NRG-70 (recommended for cosmic ray research applications), a 300 mg./sq. cm. glass wall gamma type.--Nuclear Research Corp., 112 S. 16th St., Phila. 2, Pa.

Experimental and Development Work- A simple and inexpensive device to remove radioactive contamination from liquids has been developed by A. H. Emmons, and R. A. Lauderdale, chemists, of the radioactive waste disposal research section, Oak Ridge National Laboratory, according to Dr. K. Z. Morgan, director of the health physics division there. He said this is the first time equipment has been developed and successfully tested with a complete mixture of radioisotopes that results from the fission reaction. The device consists of two cylinders containing a total of six absorbents in layers, through which contaminated liquids pass. The absorbents include various resins which retain the radioactive materials. The materials in the unit, which is 18" x 6" x 3" in size, cost about $2.50. Emmons and Lauderdale say the device will decontaminate about 10-gallons of water a day--the approximate amount consumed by 20 persons in 24 hours--and that its size can be increased, with a proportionate increase in relative efficiency.

News and Notes- A pocket radiation detection instrument for civilian defense use is now being manufactured by Tracerlab, Inc., Boston manufacturer of nucleonic devices and products. This instrument, packaged by Henry Dreyfuss, the industrial designer, resembles an electric razor in size. It will read the radiation level in an area contaminated with radioactivity from an atomic bomb attack. Concurrently, the company is installing beta gauges for the (non-contacting) measurement and control by absorption of radiation of the thickness of sheet materials in continuous production. Twenty-five such installations were being undertaken last month for such companies as: J. & J. Rogers Paper Co.; Revere Copper & Brass Co., Inc.; West Virginia Pulp & Paper; Western Waxed Paper; Appleton Coated Paper Co.; Marathon Corp.; and Grote Manufacturing Co.

Atomic Instrument Company, manufacturer of research nuclear measurement instruments, is now shipping 99% of its production to the main U. S. atomic energy projects, and their sub-contractors, according to L. W. Cronkhite, president. In new quarters (opposite MIT, Cambridge, Mass.), an approximately 4-fold increase in space has enabled a large increase in Atomic's output, Mr. Cronkhite has stated.

A cooperative plan now being used in Rochester, N.Y., for distributing radioisotopes for clinical and diagnostic use, has given financial savings to the participating hospitals and patients, as well as the benefit of research and development in the field of radiation at the University of Rochester atomic energy project. The plan embraces five Rochester hospitals (Genesee, Rochester General, Highland, St. Mary's, and Strong Memorial), the University of Rochester Medical School, and the USAEC. Under the plan, the University of Rochester Isotope Center will use facilities of the Medical School and the atomic energy project for storing, handling, and processing the radioactive materials shipped from Oak Ridge. The materials will be standardized in the "hot" laboratory maintained at the Medical School, and doses will be measured, transported to the hospitals, administered to the patients, and urine collected and counted in accord with established techniques.

ATOMIC PATENT DIGEST...latest U. S. applications & grants...

A FURTHER GROUP OF U. S. OWNED PATENTS, the outgrowth of nuclear work sponsored by the governmemt, has now been made available to interested firms. License information (the licenses are royalty-free, but non-exclusive) may be obtained from the Patent Branch, USAEC, Wash. 25, D. C. The group comprises: (1) Pulse height analyzer; Pat. No. 2,529,666. (2) Electronic regulator; Pat. No. 2,530,169. (3) Apparatus to measure local variations in flux density in a magnetic field; Pat. No. 2,530,176. (4) Fluxmeter; Pat. No. 2,530,178. (5) Pocket radiation alarms; Pat. No. 2,531,106. (6) Methods of purifying beryllium oxide; Pat. No. 2,531,143. (7) Coincidence proportional counter; Pat. No. 2,531,144. (8) Filter and valve mechanism; Pat. No. 2,531,802. (9) Magnetic measuring apparatus and methods; Pat. No. 2,531,807. (10) Coulombmeters; Pat. No. 2,531,811. (11) Voltage pulse generators; Pat. No. 2,531,830. (12) Tachometers; Pat. No. 2,531,833. (13) Apparatus for handling radioactive solutions; Pat. No. 2,531,953. (14) Corrosion testing apparatus; Pat. No. 2,532,257. (15) Processes for recovery of C-14 activities; Pat. No. 2,532,490. (16) Electronic counting circuits; Pat. No. 2,532,503. (17) Methods of preparation of neptunium trifluoride; Pat. No. 2,532,707. (18) Detection apparatus; Pat. No. 2,532,874. (19) Flanged joint sealing gaskets; Pat. No. 2,532,891. (20) Air proportional counters; Pat. No. 2,532,956. (21) Containers for radioactive samples; Pat. No. 2,533,102. (22) Purification of hydrogen; Pat. No. 2,533,138. (23) Precipitation processes and apparatus therefor;Pat. No. 2,533,149. (24) Valve control mechanism; Pat. No. 2,533,491.

GRANTS- Apparatus for studying the diffraction pattern of a material capable of emitting radioactive radiations, either spontaneously or when subjected to x-rays. U. S. Pat. No. 2,532,810, issued Dec. 5, 1950; assigned to the General Electric Co., Schenectady, N. Y.

Process for separating uranium pentachloride from a mixture containing uranium pentachloride, uranium tetrachloride, and uranium oxychloride. The mixture is treated with liquid chlorine, forming a solution containing uranium pentachloride; the substantially pure uranium pentachloride is separated from the solution. U. S. Pat. No. 2,533, 315, issued Dec. 12, 1950, to Aristid V. Grosse, New York, N. Y.

Handling uranium hexafluoride in glass and silica vessels. A process for preventing the decomposition of uranium hexafluoride in contact with a material containing chemically combined silicon, which comprises adding to the uranium hexafluroide an alkali metal fluoride. U. S. Pat. No. 2,533, 316, issued Dec. 12, 1950, to Aristid V. Grosse, New York, N. Y.

Method and apparatus for separating isotopes, which comprises ionizing the particles; setting them in motion by subjecting them to a magnetic field; subjecting the charged particles thus set in motion to a second field of force, and causing particles of one mass to travel in an arcuate path, and particles of another mass to travel in another acurate path divergent from the first. U. S. Pat. No. 2,533,966, issued Dec. 12, 1950, to Gordon Simmons, Jr., Portageville, Mo.

APPLICATION- Electrodeposition of uranium. Metallic uranium is electro-deposited on a platinum cathode from an anhydrous solution of uranium tetrabromide or uranium tribromide, at from 1 to 30-volts, from 0.01 to 0.1 amp./sq. cm., and preferably at from 30-35 degrees C. Solvents suitable for the process are organic materials, which form complexes with uranium, such as ethanol, formamide, acetanide, and glacial acetic acid. Application No. 3,507, filed Jan. 21, 1948; published Dec. 12, 1950. Inventor: Ermon D. Eastman, deceased, late of Berkeley, Calif.

NEW BOOKS & OTHER PUBLICATIONS...in the nuclear energy field...

The Development of a Policy for Industrial Peace in Atomic Energy. A comprehensive approach to the necessary harmonious relationships which must exist between contractor and employee in the atomic energy field. 104 pages --National Planning Association, 800 21st St., N.W., Washington 6, D. C. ($1.00)

The Oak Ridge Story, by George O. Robinson. Popular account of the work at, and development of, Oak Ridge, by the former Oak Ridge information officer for the USAEC.--Southern Publishers, Inc., Kingsport, Tenn. ($3.50)

RAW MATERIALS...radioactive ores & other materials for nuclear work...

UNITED STATES- Grand Junction, Colorado: Diamond drilling, part of the intensive USAEC-U. S. Geological Survey uranium exploratory program on the Colorado plateau, is at present underway in Mesa, Montrose, and San Miguel counties, in Colorado, and San Juan and Grand Counties, in Utah. About 8 contractors, with some 50 drills in operation, are presently active on the Plateau.

CANADA- A survey of the active properties, at the uranium field some 80 miles north of Sault Ste. Marie, indicates that the activity of the past season will be both continued and intensified the coming one. The past season, Ranwick Uranium Mines (the closest to actual production here) went underground, while LaBine-McCarthy will be the next to proceed underground. A scintillometer survey has been made of Canagua Mines, where some of the best samples of pitchblende in the district have come from; the findings are now being mapped. Late last year, at Batchawanna Uranium Mines, one of the two promising radioactive finds that were made there showed sections of pitchblende visually estimated to average over 5% uranium oxide. North of the Montreal river section of the district, three properties have produced discoveries. The Ottawa Associates group has a 200-foot radioactive zone; the McCoy ground has a 300-foot length, and pitchblende has been located on the Franz Prospecting Syndicate claims. Sco-Tomic Uranium Mines, in the western sector of the camp, is reported to have 250-feet of highly radioactive zones. Preliminary work, at Damascus Mines holdings, lying between Ranwick and LaBine-McCarthy, has revealed pitchblende in two places.

RADIOISOTOPES...therapeutic and tracer uses...

Salicylic acid, tagged with carbon-14, has been used in metabolism studies by R. W. Schager, of the Rheumatic Fever Research Institute, Northwestern University Medical School, Chicago. Results of the experiments (with rats as the experimental animals), which were to gain a better understanding of salicylate metabolism, showed: (1) There was no significant retention of salicylic acid by the body after 24-hours, and (2) The plasma was found to contain salicyic acid and one unidentified substance.

An investigation of the uptake of oral and injected doses of calcium-45, by non-rachitic and rachitic chicks, has been made by B. B. Migicovsky and A. R. G. Emslie, of the Division of Chemistry, Science Service, Ottawa, Canada. The work was part of a study of calcium metabolism and vitamin-D action, using chicks as the experimental animals. The experiments indicated that vitamin-D does not exert a direct effect on the mineralization of bones of the chick.

IONIZING RADIATION...investigations and notes...

The effect of x-radiation on anti-body formation has been investigated in studies by L. O. Jacobson, M. J. Robson, and E. K. Marks, of the Department of Medicine, University of Chicago, and Argonne National Laboratory. The study was made on the capacity of the rabbit to form anti-bodies after its whole body, except for the spleen or the appendix, was exposed to 800 r of x-radiation. The experimenters found that the results corroborated Hektoen's original classic findings that anti-body formation is suppressed by total-body x-radiation. It was demonstrated, in addition, that if the spleen or appendix of the rabbit is protected by lead shielding during total-body irradiation, the capacity to produce anti-bodies is retained to a marked degree, even though lymphatic tissue elsewhere in the body is temporarily destroyed.

Sincerely,

The Staff,
ATOMIC ENERGY NEWSLETTER

January 2nd, 1951.